ASSESSMENT OF DEVICES AND TECHNIQUES FOR IMPROVING INSECTION AND EVALUATION OF TREATMENT FOR INACCESSIBLE DRYWOOD TERMITE INFESTATIONS

Dr. Vernard Lewis
University of California, Berkeley

Laboratory and field evaluations are proposed to improve the inspection and treatment of inaccessible drywood termite infestations. Initial laboratory investigations will evaluate the usefulness of X-ray and temperature-enhanced infrared technologies in finding drywood termite infestations hidden behind wall coverings. These technologies exploit changes in wood density and temperature-response characteristics caused by the damaging effects of termites. The test of robustness of these new detection technologies in finding infestations will include boards covered by drywall, stucco, and wood paneling to simulate conditions found in the field. Verification of active drywood termites will include the use of commercially available microwave and acoustic emission (AE) devices. I hypothesize that the use X-ray or temperature enhanced infrared in combination with AE and microwaves devices will accurately determine the location, activity status, and extent of infestation by drywood termites for areas inaccessible to visual search. Field demonstrations of these technologies will be conducted in partnership with local pest control operators (PCOs). Planned demonstrations will include several homes and buildings in the San Francisco Bay Area and greater Los Angeles Area. Candidate structures will be inspected with these technologies, and afterwards small sections destructively sampled by removing wall coverings to determine accuracy of information obtained.

Funding is also requested to document what constitutes a drywood termite colony and frequency of foraging and feeding. Currently, definitions of drywood termite colonies are based on location; infested boards in different rooms or widely spaced are assumed different. There is no biological definition on what constitutes a drywood termite colony for wood and conditions in California. The molecular genetics of workers and cuticular hydrocarbon analyses of voided pellets components of the study will aid in determining the colony status of drywood termites and also provide a measure of failed treatments. Lastly, preliminary information obtained by my laboratory suggests drywood termites have uneven feeding patterns during the year. I further propose to use a computerized multi-channel AE recording device to document seasonality in drywood termite feeding and foraging. The acquisition of these data will allow for the better calibration of detection devices that exploit termite feeding and motion, especially during periods when drywood termite activity may be minimal.